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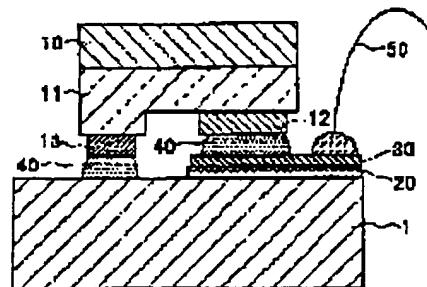
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(54) NITRIDE SEMICONDUCTOR LASER DEVICE

(57) Abstract:

PROBLEM TO BE SOLVED: To sufficiently radiate heat from a laser chip for longer service life, and enable continuous oscillation by bonding at least one of the electrodes on the chip to a lead electrode.

SOLUTION: A laser chip is die-bonded through conductive adhesive 40, such as solder and silver paste, with its electrode face side opposed to the support face side, that is, in the face-down position, and its negative electrode 12 is wire-bonded using a gold wire 50. Thus heat from the chip is transmitted to the support through the electrode excellent in thermal conductivity; therefore, favorable radiating efficiency is obtained. In addition, this makes it possible to use conductive material, such as Al, Au and Cu and semiconductor material, such as Si and GaAs, for the support. This allows a material excellent in thermal conductivity to be used for the support, which significantly improves the radiation of the chip. As a result, it is possible to lengthen the service life of the device and perform continuous oscillation.



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[Claim(s)] 9-223846

[Claim 1] The nitride semiconductor laser element which is a laser element which comes to carry out bonding of the laser chip which has the electrode of a positive/negative couple in the same side side to a base material by face down, and is characterized by forming the lead electrode in the front face of the insulator layer, and carrying out bonding of one [at least] electrode of the aforementioned laser chip to the aforementioned lead electrode while an insulator layer is formed in the front face of the aforementioned base material.

[Claim 2] The aforementioned laser chip is a nitride semiconductor laser element according to claim 1 characterized by carrying out bonding to the bonding side of a base material so that it may become almost level.

[Claim 3] The nitride semiconductor laser element according to claim 2 characterized by adjusting at least one of the thickness of an insulator layer, the thickness of a lead electrode, or the thickness of a base material, and carrying out bonding of the laser chip horizontally.

[Claim 4] A nitride semiconductor laser element given in any 1 term of the claim 1 characterized by forming the concave slot in the front face of the base material which was able to straddle inter-electrode [of the aforementioned laser chip], or the claims 3.

[Claim 5] The nitride semiconductor laser element according to claim 4 characterized by continuing and forming the aforementioned insulator layer in the interior of a slot from the bonding side of a base material.

[Claim 6] The aforementioned lead electrode is a nitride semiconductor laser element given in any 1 term of the claim 1 characterized by being continuously formed to the front face of the base material which counters with a bonding side, or the claims 5.

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